



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,659	10/22/2001	Otto J. Prohaska	03141-P0380A WWW/DC	4969
24126	7590	08/09/2007	EXAMINER	
ST. ONGE STEWARD JOHNSTON & REENS, LLC			OLSEN, KAJ K	
986 BEDFORD STREET			ART UNIT	PAPER NUMBER
STAMFORD, CT 06905-5619			1753	
			MAIL DATE	DELIVERY MODE
			08/09/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/029,659	<b>Applicant(s)</b> PROHASKA ET AL.	
	<b>Examiner</b> Kaj K. Olsen	<b>Art Unit</b> 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 July 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 20, 21, 23-28, 30, 31, 33 and 34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20, 21, 23-28, 30, 31, 33, 34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. In view of the newly cited and relied on reference below, the examiner is hereby reopening prosecution.

### ***Claim Rejections - 35 USC § 103***

2. Claims 20, 21 and 23-28, 30, 31, 33, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/36957 A1 (hereafter "WO '957") in view of any of Lawrance et al (4,272,353), Debe et al (USP 6,319,293), Fray et al (USP 4,879,005) or Bahar et al (USP 5,547,551). WO '957 is being cited and relied on for the first time with this office action. WO '957 is a foreign publication of the previously relied on Prohaska (USP 6,682,638) application, and qualifies as prior art under 102(a). Applicant's statement of common ownership of Prohaska at the time the invention was being made overcame the rejection relying on Prohaska, but would not overcome a rejection relying on WO '957. Fray was previously utilized (e.g. see office action dated 4/15/2005), but was withdrawn when the claims were amended to state that the ionomer was without moisture "since inception". However, the claims now state that the membrane is merely dry during various manufacturing steps of the sensor. Hence, Fray is being reintroduced here. Bahar is being cited and relied on for the first time with this office action.

3. WO '957 discloses a method of making a sensor comprising the steps of providing a substrate 10, providing at least one opening 20 in the substrate, placing an electrode 3 proximate to the at least one opening, contacting a ionomer membrane 5 to the substrate and electrode, providing at least one hole 6 in the ionomer membrane, and aligning the at least one hole with

Art Unit: 1753

the at least one opening for defining a gas passage. See fig. 1; p. 4, l. 24 through p. 14; and p. 9, l. 16 through p. 10, l. 3. WO '957 does not explicitly disclose whether the ionomer membrane is wet or dry during the various steps of the method of making of the sensor. However, the prior art teaches that the membrane can be "dry" during electrochemical cell construction. Lawrance teaches that keeping the membrane dry during sensor construction allows the membrane to be roughened providing greater adhesion to catalyst particles. See col. 11, l. 62 through col. 12, line 48. WO '957 teaches attaching the ionomer to catalytic electrodes as well as to other catalytic particles. See p. 5, ll. 4-14 and claim 7. Debe also teaches that the membrane could be dried prior to construction of an electrode-membrane assembly thereby obviating the need for unnecessary wetting steps. See col. 16, ll. 50-61; col. 23, l. 5; col. 25, ll. 20-43 and col. 31, ll. 17-31. Fray teaches that although the membrane may be wet earlier, it is to be dried prior to its attachment to a substrate 3 and prior to the attachment of electrode 6. See col. 2, l. 39 through col. 3, l. 20. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teachings of any of Lawrance, Debe, or Fray because and utilize a dry form of membrane during the specified construction steps of the sensor of WO '957 because the prior art repeatedly recognized the use of the dry form of the membrane during cell construction and because the dry form facilitated the deposition of catalytic particles to the ionomer, which is precisely relevant to the teaching of WO '957.

4. Moreover, WO '957 suggests the use of hot pressing for its contacting step (see p. 11, ll. 26 and 27 and p. 12, ll. 18-20). Lawrance teaches that hot-pressing (i.e. a conventional technique for attaching an ionomer membrane to other substrates via heat (see EP '041 and Lawrance)) utilizes temperatures of 182-188 °C (see col. 12, ll. 33-35), which greatly exceeds the boiling

Art Unit: 1753

temperature of water. Hence this indicates that in order for one to hot-press a membrane to a substrate surface, one would have had to apply enough heat to dry the membrane first because thermodynamically the membrane could not get to those temperatures until the water was driven from the membrane anyway. In view of this, one possessing ordinary skill in the art would have recognized that a dry form of the membrane would have been preferable for hot-pressing because the hot-pressing stage would have occurred more quickly with less heat application for an already dried membrane over a wet membrane.

5. Finally, Bahar teaches that ionomer films, including Nafion, are stronger in a dry state than in a wet hydrated state. See col. 20, ll. 4-8 and table 2. Because WO '957 applies techniques such as hot pressing and die punching to the ionomer (p. 11, ll. 26 and 27 and p. 12, ll. 13-15), one possessing ordinary skill in the art would have been motivated to rely on the use of the stronger dry form of the membrane, as suggested by Bahar, during these various construction steps of WO '957 so that the ionomer membrane is less susceptible to tearing and/or warping during sensor construction.

6. With respect to aligning the opening with the electrode, see WO '957, fig. 1.

7. With respect to positioning a polymer layer over the electrode, see p. 12, ll. 21-24 of WO '957.

8. With respect to providing counter and reference electrodes, see p. 5, ll. 1-4 of WO '957.

9. With respect to the provision of a reservoir, see p. 5, ll. 15-20 of WO '957.

Art Unit: 1753


*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Friday from 8:00 A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AU 1753  
August 7, 2007



**KAJ K. OLSEN**  
**PRIMARY EXAMINER**